

REMARKS

The Office Action mailed April 20, 2005 has been carefully considered. Reconsideration in view of the following remarks is respectfully requested.

Interview Record, Proposed Claim Changes, and Rejection Under 35 U.S.C. 112, First

Paragraph

Applicants gratefully acknowledge the courtesy and consideration extended to Applicants' undersigned representative during the telephone interview with Examiner Nguyen on June 27, 2005.

During the interview, Applicants, as represented by the undersigned, proposed the addition of the language "wherein said object is one which is selected to be capable of generating significant back scatter of x-rays." A proposed amendment, for discussion purposes only, was faxed to the Examiner in advance of the interview, the proposed amendment containing the above-quoted language as an addition to independent Claims 1, 14 and 15. Applicants identified the supporting portions in the specification for the proposed amendment, and explained that the proposed additional language rendered the claims patentably distinct over Friddell. Specifically, the following reasoning, quoted directly from the proposed amendment faxed to the Examiner, was advanced:

[T]he independent claims are shown as each incorporating a proposed new limitation, which specifies that the object being

detected "is one which is selected to be capable of generating significant back scatter of x-rays." Support for this limitation can be found for example on page 4, lines 6 - 7. According to these claims therefore, a significantly backscattering object is detected using an arrangement which includes a *low Z*-material panel.

By comparison, Friddell discloses an opposite arrangement in the case of a significantly back scattering object. Specifically, in the beginning of column 7, Friddell states:

Alternatively, for inspecting low atomic number materials such as hydrocarbon plastics, an illuminator 32 comprising *high* atomic number solid material, having a thickness from 0.001 to 0.1 cm, may be utilized.

Friddell can use this arrangement because Friddell is not targeting high scattering objects (such as people) and low scattering objects (such as weapons) *at the same time*. Therefore, Friddell opts for the situation giving the maximum contrast, which is one in which, if the objects are high scattering, then an illuminator 32 having a high atomic number and therefore a high absorption is selected. Conversely, when the objects have low back scattering, Friddell uses low atomic number material for illuminator 32, as explained in column 6, lines 39 - 45.

The Examiner's response to these proposed changes was that they were, for the apparatus claims, a matter of intended use and therefore did not structurally distinguish the claimed arrangement from Friddell.

Without conceding the propriety of such a rejection, Applicants have in the present Amendment abandoned the above proposed changes in favor of other changes presented herein. These other changes are discussed below.

The Examiner also pointed out during in the interview that the 35 U.S.C. 112, first paragraph rejection of Claims 1 - 27 in the final Office Action mailed April 20, 2005, still

needed to be addressed by Applicants. The offending language on which the rejection is based is the language specifying that "the pencil beam of x-rays is of sufficiently low energy to avoid detection if passing through the object after backscattering by the Z material panel."

By way of the present amendment, this offending language has been removed. In its place, independent Claims 1, 14, and 15 have been amended to state that the "pencil beam of x-rays exposes said object to an x-ray dose in the range of about 1 microRem to about 10 microRem." Further, new Claims 28 – 42 have been added, specifying additional radiation dosage and CV ranges, along with x-ray tube operating parameters. Additional support for some of these changes can be found in the U.S. pat. no. 5,181,234, which the present specification incorporates by reference (see paragraph [00015]) pursuant to M.P.E.P. § 608.01(p). Passages from columns 5, 6, 8, 9, 12 and 13 of the '234 patent have been used as the bases for paragraphs [00016.1] – [00016.7] added to the present application. No new matter has been introduced.

Rejection(s) Under 35 U.S.C. § 103(a)

Claims 1 – 27 were rejected under 35 U.S.C. § 103(a) as unpatentable over Friddell (U.S. pat. no. 4,974,247).

Claims 1, 14 and 15 have been amended to state that the "pencil beam of x-rays exposes said object to an x-ray dose in the range of about 1 microRem to about 10 microRem." This limitation is neither taught nor suggested in Friddell. Friddell relies on radiation passing through the inspection object *twice* to provide sufficient contrast,¹ and builds a system which is premised on the ability to expose the inspected object to levels of radiation which, in the case of human

beings, would be unacceptably high. Friddell maintains that his disclosed arrangement is superior to the prior art because the prior art relies exclusively on radiation initially scattered by the inspected object,² whereas Friddell not only uses this initially scattered radiation, but also relies on radiation that passes through the object twice, by way of illuminator 32, to provide the necessary contrast. Because Friddell is inspecting inanimate objects such as multi-level boxes,³ hydrocarbon plastics,⁴ and hydraulic hoses,⁵ high radiation dosage necessary to achieve this dual passage through the object can be used. By comparison, when inspecting people, such as airport passengers as one application of the present invention contemplates, the radiation dosage becomes a very important consideration, and subjecting passengers to this dual dosage may pose unacceptable health risks. Government guideless are provided for the amount of x-ray radiation to which people may be exposed, as paragraph [0004] of the specification explains, and the arrangement of the present invention is crafted in compliance with these guidelines, with the amended claims specifying dosage levels of about 1 – 10 microRem (Claims 1, 14, and 15); about 1 – 5 microRem (Claims 28, 33 and 38); and about 3 microRem (Claims 29, 34 and 39). These parameters are neither taught nor suggested by Friddell, which is directed to the inspection of inanimate objects, and which provides a design based on the ability to pass radiation through the objects twice to achieve suitable contrast. As explained in newly added paragraph [00016.7] corresponding to col. 13, lines 9 – 31 of the '234 patent, "the X-ray energy selection of the present invention provides higher contrast images allowing the use of approximately a factor of twenty-five (25) times lower radiation dose than prior art systems." Moreover, it should be appreciated that the prior art systems to which this passage refers are of the type in which x-rays

¹ *Id.*, col. 6, ll. 8 – 19.

² Friddell, col. 6, ll. 2 – 4.

³ *Id.*, col. 6, l. 55.

⁴ *Id.*, col. 7, l. 2.

pass through the object once, and are detected on the other side. In Friddell, it will appreciated, the x-rays must pass through the object twice before being detected, effectively doubling this already unsuitably high exposure.

Another reason the claimed invention is not obvious in view of Friddell is because Friddell in fact teaches away from invention. For instance, Friddell states that when a *high* scattering object is under inspection, optimizing contrast would require the use of a *high* atomic number panel (*see* beginning of col. 7). Conversely, Friddell states that when a low scattering object is under inspection, the use of a low atomic number panel is necessary (col. 6, ll. 39 – 45). In the present invention as claimed, a *high* scattering object—that is, a human—is inspected using a *low* Z number panel in the background. This is in direct contravention of the teachings of Friddell, and comes about because in the present invention, the high contrast sought is a function of not only the inspected object and background, but also of a third factor—the contraband which the inventive system aims to discover. The characteristics of x-ray interaction with each of these three components must be balanced to give the proper image for detecting contraband. Friddell is not concerned with the uncertain presence of contraband and always knows the nature of the object under inspection. Accordingly, Friddell has the luxury of selecting the background based on the nature of the known object and the background, and can resolutely claim that a high scattering object requires a high atomic number panel, and vice versa. Thus one of ordinary skill in the art, in seeking to achieve the high contrast required to detect objects having different x-ray interaction characteristics, would not be motivated by the teachings of Friddell, which is directed to the detection of a single type of object—high scattering or low scattering—at a time. The

⁵ *Id.*, col. 7, l. 14.

obviousness rejection of Claims 1, 15, and 16, and the claims dependent thereon, under 35

U.S.C. 103(a) based on Friddell is therefore improper and should be withdrawn.

Conclusion


In view of the preceding discussion, Applicants respectfully urge that the claims of the present application define patentable subject matter and should be passed to allowance.

If the Examiner believes that a telephone call would help advance prosecution of the present invention, the Examiner is kindly invited to call the undersigned attorney at the number below.

Please charge any additional required fees, including those necessary to obtain extensions of time to render timely the filing of the instant Amendment and/or Reply to Office Action, or credit any overpayment not otherwise credited, to our deposit account no. 50-1698.

Respectfully submitted,
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